

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS - STANDARD SPECIFICATION
T-901
Seeding

DESCRIPTION

1.1 This item shall consist of turfing the areas shown on the plans or designated by the Engineer. Turfing shall include advance preparation of the seed bed, fertilizing, and seeding. The work shall be accomplished during the seasons indicated on Map "A" unless otherwise specified.

Seeding or fertilizing of other than standard seed mixtures and at other than standard rates, shall be accomplished when specifically designated items, mixture rates are included in the plans or documents.

MATERIALS

2.1 **Seed.** The seed mixtures shown in Table 1 are standard mixtures for Michigan airports. The specific mixture to be used, or mixtures other than in the table, will be specified in the plans or documents. Seed shall conform to the requirements of Fed. Spec. JJJ-S-181.

Seed shall be furnished separately or in mixtures in standard containers with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished and, in case of a

mixture, the proportions of each kind of seed.

2.2 **Lime.** Lime, if specified, shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 mesh sieve and 50% will pass through a No. 100 mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium, oxide. Lime shall be applied at a rate of 2000 pounds per square acre and incorporated to a depth of 4 inches unless other rates and depths are shown in the plans or documents.

2.3 **Fertilizer.** Fertilizer is included as a part of the turfing pay item. All areas, shown on the plans or designated by the Engineer to be turfed, shall be fertilized with the following standard minimum pounds of available plant food per square acre: 60 lbs. Nitrogen (N); 60 lbs. Phosphoric Acid (P_2O_5); and 60 lbs. Potash (K_2O). This is equivalent to a commercial 12-12-12 fertilizer applied at 500 lbs. per acre

Fertilizer shall meet the specified requirements of the applicable state and federal laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

- (a) A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;
- (b) A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or

(c) A granular or pellet form suitable for application by blower equipment.

2.4 Soil for Repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The

soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the Engineer before being placed.

SEEDS FEDERAL SPECIFICATION JJJ-S-181				STANDARD MIXTURES PERCENTAGE			
Name	Minimum % Pure Seed	Minimum % Germination & Hard Seed	Maximum % Weed Seed	A	B	C	D
Kentucky Blugrass (<i>Pod pratensis</i>)	85	80	0.5	85			
Red Fescue (<i>Festuca rubra</i> var.)	98	85	0.5		95		
Perennial Ryegrass (<i>Lolium perenne</i>)	98	90	0.5	15	5		100
Cereal Rye (<i>Secal cereale</i>)	97	85	0.1			100	
STANDARD POUNDS PER ACRE APPLICATION				100	100	80	50
INTENDED USE (FOR GUIDANCE OF DESIGNER ONLY)				Rich Loams Mucks Terminal Lawns	Sands and Clays	Temp. Cover	

CONSTRUCTION METHODS

3.1 Advance Preparation and Cleanup.

After grading of areas have been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches in any diameter, sticks, stumps, and other debris which might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion by

other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than

5 inches as a result of grading operations and, if immediately prior to seeding, the top 3 inches of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

However, when the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches. Clods shall be broken and the top 3 inches of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

3.1 Dry Application Method.

(a) Liming. Lime, if required, shall be applied separately and prior to the application of any fertilizer or seed and only on seedbeds which have previously been prepared as described above. The lime shall then be worked into the top 3 inches of soil after which the seedbed shall again be properly graded and dressed to a smooth finish.

(b) Fertilizing. Following advance preparations and cleanup, and liming if required, fertilizer shall be uniformly spread at the rate which will provide not less than the minimum quantity required by this spec. or as specified in the plans and documents.

(c) Seeding. Grass seed shall be sown at the rate specified in Table 1 or as specified in the plans and documents immediately after fertilizing, and the fertilizer and seed shall be raked within the depth range stated. Sowing of seed shall be done with a Brillion seeder or approved equal except that small areas or lawns may be seeded by broadcast or hoppers. Grain drills will not be permitted. When a Brillion type seeder is used, raking or rolling, as specified in paragraph (d), will not be required. In no case shall the seed be

covered to a depth greater than $\frac{1}{4}$ inch.

Seeds of legumes, either alone or in mixtures shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons indicated on Map "A" or as specified on the plans and documents a cover crop shall be sown by the same methods required for grass and legume seeding.

(d) Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawnroller, weighting 40 to 65 pounds per foot of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per acre of width for sandy or light soils.

3.3 Wet Application Method.

(a) General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as required by this specification or as specified in the plans and documents.

(b) Spraying Equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square

inch. The pump shall be mounted in a line which will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distances varying from 20 feet to 100 feet. One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For ease of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected.

(c) **Mixtures.** Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds of lime shall be added to and mixed with each 100 gallons of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds of these combined solids shall be added to and mixed with each 100 gallons of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is disapproved by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Engineer.

(d) **Spraying.** Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches, after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray which shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to insure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area. Checks on the rate and uniformity of application may be made by

observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces which are to be mulched as indicated by the plans or designated by the Engineer, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

3.4 Maintenance of Seeded Areas. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeded as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

Approximately 45 days after turfing, an inspection shall be made by all parties concerned to determine if the turf is acceptable. If it is determined that certain areas did not receive the proper distribution of seed and/or fertilizer or the specifications were not adhered to, the Contractor, at his or her own expense, will be required to re-turf those areas. This repair work shall be done between the specified turfing dates, under the direction of the Engineer.

If it is determined by the inspection that an established turf cannot be expected on all or part of the turfing area, through no fault of the Contractor, the Contractor will be required to re-turf, with payment, all areas designated by the Engineer. Payment, for re-turfing under this condition, will be made to the Contractor at the contract unit price bid for "Turfing." Before re-turfing is authorized, a change order covering increased area and extending contract time shall

be executed and all parties concerned shall have approved it.

METHOD OF MEASUREMENT

4.1 The area of turfing, or liming to be paid for shall be the number of acres and tenths thereof, measured by surface area, of the specified work prepared, completed, and accepted.

BASIS OF PAYMENT

5.1 The area of turfing type work, determined as provided above, shall be paid for at the contract unit price per acre for the specified work which price and payment shall constitute full compensation for removing debris, tilling, smooth and finish grading, furnishing and applying all materials, and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under the nomenclature and seven digit item number specified in the plans and proposal for each type of turfing work required per square meter.

The first three digits of any item number for work included under this specification shall be 901, i.e. 901XXXX.

TESTING AND MATERIAL REQUIREMENTS

Test and Short Title

None

Material and Short Title

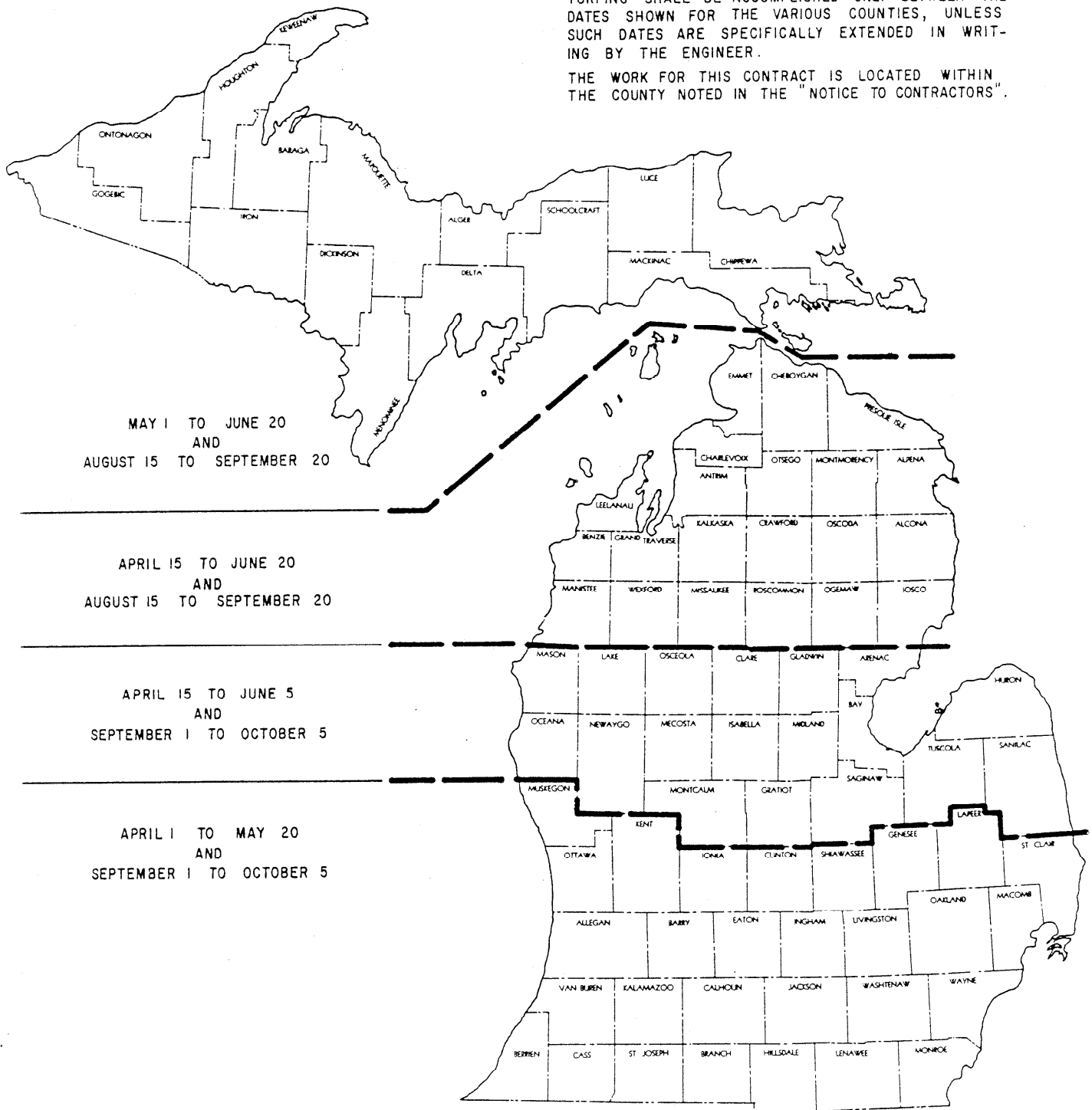
*JJJ-S-181-Seed

*Federal Specification

MAP A

TURFING SHALL BE ACCOMPLISHED ONLY BETWEEN THE DATES SHOWN FOR THE VARIOUS COUNTIES, UNLESS SUCH DATES ARE SPECIFICALLY EXTENDED IN WRITING BY THE ENGINEER.

THE WORK FOR THIS CONTRACT IS LOCATED WITHIN
THE COUNTY NOTED IN THE "NOTICE TO CONTRACTORS".



ALLOWABLE TURFING SEASONS IN MICHIGAN